SPEED VIOLATION CONTROL SYSTEM USING DEDICATED SHORT-RANGE COMMUNICATION

CROSS-REFERENCE TO RELATED APPLICATIONS

[001] This application claims of Korean Application No. 10-2003-0037525, filed on June 11, 2003, the disclosure of which is incorporated fully herein by reference.

FIELD OF THE INVENTION

[002] The present invention relates to a speed violation control system using a dedicated short-range communication (DSRC) and, more particularly, to a system adapted to effectively check the state of a moving vehicle by using the DSRC to thereby warn or control a driver in relation to the speed of the vehicle.

BACKGROUND OF THE INVENTION

[003] There are a number of ways that speed limits are currently enforced. For example, a vehicle that exceeds a legal speed limit can be detected via a speed camera, which is installed above a roadway for photographing the license plate of a speeding vehicle and reading it at a traffic information center. More traditionally, a police officer may directly issue a speeding ticket to the speeder based on a speed detector, such as a radar gun.

[004] However, there is a drawback in the conventional speed violation control systems in that examining photographs taken via the speed camera and the use of police officers to monitor speeding vehicles result in increased labor costs and manpower.

SUMMARY OF THE INVENTION

[005] Embodiments of the present invention provide a system adapted to detect the state of a moving vehicle using DSRC to thereby effectively warn or control a driver in relation to the speed of a vehicle.

[006] In one embodiment of the present invention, a speed violation control system using a DSRC comprises Road-Side Equipment (RSE) for transmitting the information of the vehicle speed and for receiving the processed results. On-Board Equipment (OBE) mounted inside a vehicle transmits the information of the vehicle speed to the RSE and then receives the processed result from the RSE. An Electronic Control Unit (ECU) receives the information of the vehicle speed from a speed detecting sensor in order to output it to the OBE and to reproduce the processed result inputted from the OBE in a voice format via a voice output means. A traffic information center analyzes the information of the vehicle speed received from the RSE and then outputs the processed result, according to the analysis, to the RSE.

BRIEF DESCRIPTION OF THE DRAWINGS

[007] For a better understanding of the nature and objects of the present invention, reference should be made to the following detailed description with the accompanying drawings, in which:

[008] FIG. 1 illustrates a configuration of a speed violation control system according to an embodiment of the present invention; and

[009] FIG. 2 is a flowchart illustrating an operational procedure of the speed violation control and the warning according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0010] The preferred embodiment of the present invention will now be described in detail with reference to the accompanying drawings.

[0011] As shown in FIG. 1, a speed violation control system according to the present invention comprises a vehicle speed sensor 101, an ECU 102, a voice outputting means 103, and an OBE 100, that are all installed inside the vehicle. ECU 102 may comprise a processor and associated hardware and software as may be selected and programmed by a person of ordinary skill in the art.

[0012] The vehicle speed sensor 101 detects a vehicle speed and inputs it to the ECU 102. The voice outputting means 103 is designed to reproduce a voice message inputted from the ECU 102, for example a warning message, a fine message, a control message or the like. Voice outputting means 103 may comprise a speaker and other associated hardware appropriately driven by ECU 102 as may be configured by a person of ordinary skill.

[0013] The ECU 102 receives the vehicle speed from the vehicle speed sensor 101 and outputs it to the OBE 100. The ECU 102 then inputs a message (a warning message, a fine message, a control message or the like) that is inputted from the OBE 100, to the voice outputting means 103 for reproducing it in a voice format.

[0014] The OBE 100 transmits the vehicle's unique information and the information of the vehicle speed, which is inputted from the ECU 102, to the RSE 200a-200n. The OBE 100 then receives the processed result regarding the vehicle speed (e.g., warning message, fine message, control message or the like) from the RSE 200a-200n and then inputs it to the ECU 102. OBE 100 and RSE 200a-200n generally communicate via radio transmissions. Each may include transceivers and other

hardware and software as may be selected and programmed by persons of ordinary skill in the art based on the teachings contained herein. In a preferred embodiment the OBE and RSE communicate via 5.8 GHz radio communication. In such an embodiment the transmission speed and distance are 1Mbps and about 200m, respectively.

[0015] The RSE 200a-200n transmits the information of the vehicle speed and the vehicle's unique information delivered from the OBE 100 as well as the unique information of the RSE to a traffic information center 400. The RSE 200a-200n then receives the processed result of the vehicle speed from the traffic information center 400 and transmits it to the relevant OBE 100 by using the vehicle's unique information.

[0016] The traffic information center 400 analyzes the information of the vehicle speed received from the RSE 200a-200n and then transmits the processed result (e.g., warning message, fine message, control message or the like) according to the analysis, to the relevant RSE 200a-200n by way of using the RSE's unique information. The traffic information center 400 communicates with a plurality of the RSE 200a-200n via a multiplexer 300.

[0017] The operational procedure according to an embodiment of the present invention will now be described.

[0018] The ECU 102 receives the input of the information of the vehicle speed from the vehicle speed sensor 101 in real time for transmitting it to the OBE 100 (S100).

[0019] The OBE 100 transmits the pre-saved vehicle's unique information (license number, for instance) and the information of the vehicle speed inputted from the ECU 102 to the RSE 200a-200n in real time (S101).

[0020] The RSE 200a-200n transmits the information delivered from the OBE 100 as well as the RSE's unique information to the traffic information center 400 (S102).

[0021] The traffic information center 400 examines the OBE information (vehicle information and speed information) and the RSE information (RSE's unique information) and determines whether the speed of a vehicle is in the scope of a warning speed (e.g., when a vehicle is moving at 90-100km/hr in a 100km/hr speed limit zone) (S103). If the vehicle is within the warning speed zone, the traffic information center 400 transmits a warning message to the relevant RSE 200a-200n (S104).

[0022] The RSE 200a-200n transmits the warning message to the OBE 100 of the relevant vehicle (S105). The OBE 100 transmits the warning message via the ECU 102 to the voice outputting means 103 (S106). The voice outputting means 103 informs a driver of the warning message in a voice format (S107).

[0023] If the vehicle does not reach the warning speed range as a result of step S103, the vehicle is examined whether it exceeds the speed limit (e.g., 100km/h), and if so, a fine message and a control message are transmitted to the relevant RSE 200a-200n (S108, S109). Then, the RSE 200a-200n transmits the fine message and the control message to the OBE 100 of the relevant vehicle (S110).

[0024] The OBE 100 transmits the fine message and the control message via the ECU 102 to the voice outputting means 103 (S111). The voice outputting means 103 notifies the driver of the fine message and the control message in a voice format (S112).

[0025] Embodiments of the present invention may be applied in other various systems as long as the claims, detailed description, and attached drawings are in the scope of the present invention.

[0026] As apparent from the foregoing, there is an advantage in the speed violation control system using a dedicated short-range communication in that the present invention notifies a driver of certain control details in real time and prevents

vehicle accidents in advance via warning messages when the vehicle exceeds a safe speed zone, thus eliminating the manpower needed to examine photographs of speeding vehicles.